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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,393	03/15/2001	James F. Brennan III	56506USA6A.002	3589

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Attention: Nestor F. Ho
Office of Intellectual Property Counsel
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EXAMINER
CALEY, MICHAEL H

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/809,393	Applicant(s) BRENNAN ET AL.	
	Examiner Michael H Caley	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-14 and18* is/are allowed.

6)☒ Claim(s) *1-11,15-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4 and 5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-11, 16, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibsen et al. (*Custom Design of Long chirped Bragg Gratings: Application to Gain-Flattening Filter with Incorporated Dispersion* Compensation, IEEE Photonics Technology Letters, Vol. 12, No. 5, May 2000) in view of Eggleton et al. (European Patent Application EP1030472A2).

Regarding claims 1, 6-9, and 16, Ibsen discloses a reflection bandwidth having a full width at half maximum that is greater than 25 nm. Ibsen fails to disclose a reflection delay ripple of less than +/- 30 ps.

Eggleton teaches a chirped fiber Bragg grating with a reflection delay ripple amplitude of +/- 8 ps (Figure 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed a Bragg grating with a reflection delay ripple amplitude of less than +/- 30 ps. The reflection delay ripple amplitude represents irregularities inconsistent with the expected performance of the grating. Designing the grating with a reflection delay ripple amplitude less than +/- 30 ps would suppress inconsistencies of the grating and therefore

improve its quality. Such a design specification would be advantageous to improve the data rate and bit-error rate of the communication line in which the grating is used.

Note regarding claim 16 that the method of determining the reflection delay ripple amplitude is not considered by the Office to be a further limitation to the apparatus claim. The data provided by the reference is considered to be valid unless proven otherwise.

Regarding claims 10 and 11, Ibsen fails to disclose a high-frequency reflection delay ripple of less than +/- 30 ps. The reflection delay ripple amplitude disclosed by Eggleton represents a total ripple amplitude, including both high and low-frequency components. The amplitude of the high frequency component of the ripple is assumed to be less than the total ripple amplitude and therefore less than +/- 30 ps.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have designed the device such that the high-frequency delay ripple amplitude is less than 30 ps in order to improve characteristics of the communications system such as data rate and bit-error rate.

Regarding claim 2, Ibsen discloses a dispersion greater than 100 ps/nm (Figure 3).

Regarding claim 3, Ibsen fails to disclose the grating as having a dispersion greater than 400 ps/nm. Eggleton discloses a grating as having a dispersion with a magnitude greater than 400 ps/nm (Figure 7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have designed Ibsen's dispersion compensating grating with a greater dispersion of 400 ps/nm. Such an alteration would yield a compensator capable of compensating for a higher degree of chromatic dispersion than the device disclosed by Ibsen. An alternate and

advantageous layout of a communications system would be possible with this improvement in which less chirped grating dispersion compensators would be necessary over given length of fiber.

Regarding claim 4, Ibsen discloses an insertion loss greater than 0.1 dB (Page 499).

Regarding claims 17 and 20, Ibsen discloses the chirped Bragg grating as a component of an optical communications system (Page 498, Introduction).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ibsen in view of Eggleton and in further view of Laming et al. (U.S. Patent No. 6,292,601).

Ibsen fails to disclose the chirped grating dispersion compensator as having an insertion loss greater than 1 dB. Laming, however, discloses a chirped Bragg grating dispersion compensator as having an insertion loss of greater than 1 dB (Column 4 lines 9-14). As disclosed by Ibsen, insertion loss in a chirped Bragg grating is proportional to the length of the grating (Figure 1(a) see 2 cm uniform grating vs. 1 cm long uniform grating).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed a longer grating and thereby achieve an insertion loss greater than 1 dB. A longer grating would have been advantageous since it would be able to compensate for dispersion over a greater bandwidth. The lost power could be restored through an amplifier as taught by Laming (Column 4 lines 9-14).

Claims 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibsen in view of Eggleton and Laming and in further view of Riant et al. (U.S. Patent No. 6,400,868).

All of the proposed limitations are disclosed by Ibsen, Eggleton, and Laming except for the Bragg grating as a component in an optical fiber comprising a core and a cladding. Riant teaches a chirped Bragg grating as a dispersion compensator in an optical fiber with a core and a cladding (Column 2 lines 45-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the chirped Bragg grating in an optical fiber as a dispersion compensator. Such a device used in a communications optical fiber with a core and cladding would be useful for increasing the data rate and decreasing the error rate due to degradation of the signal.

Note that the method of determining the reflection delay ripple amplitude is not considered by the Office to be a further limitation to the apparatus claim. The data provided by the reference is considered to be valid unless proven otherwise.

Regarding claim 19, Ibsen discloses the chirped Bragg grating as a component of an optical communications system (Page 498, Introduction).

Allowable Subject Matter

Claims 12-14 and 18 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to disclose a chirped Bragg grating with the claimed dispersion magnitude and bandwidth that accomplishes a bit-error rate between 10^{-9} and 10^{-10} of a 10 Gbit/s communication system with a signal to noise ratio varying less than 3 dB.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H Caley whose telephone number is (703) 305-7913. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

mhc
November 1, 2002

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800